Attachment I
Rate Center Paper
April 1999

MCI
1801 Pennsylvania Avenue, NW
Washington, DC 20006

RECEIPT

May 4, 1999

EX PARTE

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

NSD File No. L-98-134

Dear Ms. Salas:

On May 3, 1999, Mary DeLuca, Hank Hultquist, and I of MCI WorldCom met with Yog Varma, Blaise Scinto, Tejal Mehta, Jeannie Grimes, Jordan Goldstein, and Patrick Forster of the Common Carrier Bureau and Joel Taubenblatt of the Wireless Telecommunications Bureau. We distributed and briefly discussed MCI WorldCom's white paper, "Rate Areas and Numbering: A Primer" and also discussed issues related to fill rates and NANPA exhaust. The attached documents were distributed at the meeting.

In accordance with section 1.1206(b)(2) of the Commission's rules, 47 C.F.R. § 1.1206(b)(2), an original and one copy is being filed with your office.

Sincerely,

Lori Wright
Senior Manager, Regulatory Affairs

cc: Yog Varma
Blaise Scinto
Tejal Mehta
Jeanine Grimes
Jordan Goldstein
Patrick Forster
Joel Taubenblatt

1999: Crossroads for Numbering Policy

MCI WorldCom, Inc.

May 3, 1999

Discussion Overview

- Inefficient assignment practices cause increasingly rapid area code exhaust.
- State responses will create patchwork number policy and can harm competition.
- FCC must help the states and preserve competition by solving the root cause of problem.
  - NRO NPRM as soon as possible.
  - Pooling rules, that include all number assignees, by year end.

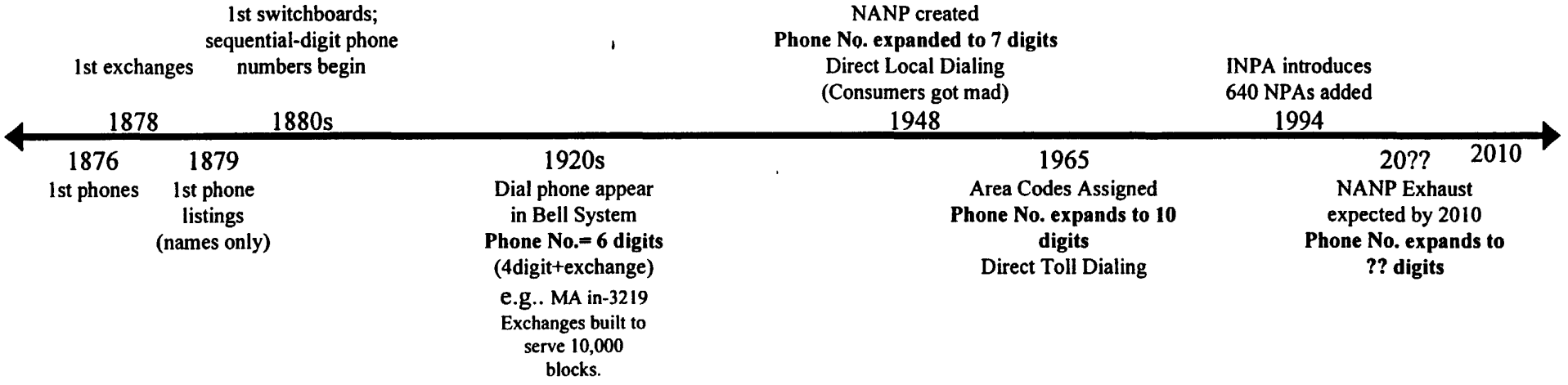
NXX Assignment Wastes Numbers

- Service providers obtain numbers in blocks of 10,000.
- CLECs require at least one block of numbers for each rate area.
  - With 20-80 rate centers in a metropolitan area, an ILEC, 4-5 CLECs and 4-5 wireless providers can exhaust an area code.
- Monopoly-based assignment practice inadequate for competition.

State Fixes Won't Work, But Will Harm Competition

- Rapid area code exhaust drives states to try to fix matters on their own.
  - Seeking broad, delegated authority over number administration.
- Futile desire to preserve 7-digit dialing leads states to propose discriminatory relief plans.
  - Geographic splits that divide rate areas.
  - Technology-specific overlays.

Evolution of the Numbering Plan



Consistent, Efficient, Pro-Competitive Policy Needed

- Competitors need numbers
- Consumers need competition
- Dialing parity is the national policy

Critical Issues with Pooling

- Need quick action from FCC to set national policy:
  - Avoid requirements to return block of numbers;
  - Everyone must play pool.
- Short Term:
  - Exercise caution with State Petitions;
  - Future assignment of 1K blocks;
  - Should allow UNP (Phase 1);
  - Need quick action from FCC to set national policy
- Long Term:
  - Explore ITN;
  - Phase 2/3 UNP;
  - Everyone in the pool at once.

NANP Exhaust must be Delayed

- FCC needs to address NANP exhaust.
- Wireless LNP critical to maximum extension of the NANP.

Conclusions

- Local 10 digit dialing is inevitable.
- Current assignment practices need to evolve for competitive market.
- Everyone must play pool.
- Proceed with caution in state requests.
- Move quickly on number conservation policies by issuing NPRM.

Rate Areas and Numbering:

A Primer

MCI WorldCom, Inc.

April 1999

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Figures and Tables

1.0 Introduction

This paper provides a high level technical review of rate areas. It begins with a discussion of the rating and routing functions that are embedded in each number address and then describes how wireline carriers utilize consistent rate areas in their networks today. The paper then discusses how rate center consolidation and inconsistent rate centers affect specific code conservation measures. The paper concludes with a long-term alternative that discusses how removal of the rating intelligence from the telephone number address can facilitate number conservation.

2.0 Rating, Routing and NPA-NXXs

Call rating and routing are two critical functions for all telecom carriers. Every carrier's operations support systems and switching systems rely on information that is embedded in end user telephone numbers. Switching systems still use the NPA-NXX as the primary identifier an end user's approximate location.[1]

The customer's NPA-NXX is also used in rating calls for both customer and inter-carrier billing. Historically, incumbent local exchange carriers (ILECs) used rate areas to simplify call rating. A vertical and horizontal longitude and latitude (V&H coordinate) is the "rate center" of each rate area and represents the virtual location of all end-users in that rate area. Each NPA-NXX is associated with a pair of V&H coordinates, which is treated as a surrogate for the end user's location. Competitive local exchange carriers (CLECs) have deployed switched network technology such that each switch covers a wide geography and serves multiple rate areas. CLECs continue to associate each NPA-NXX with specific V&H coordinates, thereby following industry practices that existed at the time of their entry into the local exchange business.

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[1] The local number portability/local routing number (LNP/LRN) technology that is used for porting existing customer numbers to another carrier effectively removes the routing intelligence from the 10-digit number address of a ported number. Each telephone number address that is ported has an associated LRN, which correlates the customer telephone number with a switch identity. The LRN is determined through interaction between a switch and a Service Control Point (SCP) during call processing and is used for routing instead of the called number's NPA-NXX.

In the public switched telephone network, which consists of numerous service providers, rating and routing information must be communicated among all carriers. The Traffic Routing Administration (TRA) process, which is run by Telcordia (the company formerly known as Bellcore) provides carriers, for a fee, with tools to update and receive periodic downloads of industry wide rating and routing information. Updates of rating and routing information must be made to TRA.

The Routing Database System (RDBS) allows carriers to input their own rating and routing information directly into TRA databases. Carriers that prefer not to update the information directly can contract with third parties to enter the data on their behalf. In either event, when NPA-NXXs are allocated to a carrier, appropriate rating and routing information must be entered into TRA before the NPA-NXX can be utilized.

The Local Exchange Routing Guide (LERG) is the download mechanism that communicates rating and routing information to all subscribing carriers. The LERG's primary function is to provide information for (1) routing of interLATA calls by interexchange carriers, (2) use by local exchange carriers and wireless providers, and (3) any other company that requires information about the network and numbering.[2]

Carriers may obtain LERG data on a monthly, quarterly, or one-time basis.[3] Carriers may also elect to receive intermediate "change files" to get the most updated information. However received, LERG data are processed into both the operational support systems and switching platforms so that rating and routing relationships of NPA-NXXs can be updated as necessary.

Depending on carrier practices, distance may be an element used to rate telephone calls.[4] Distances are calculated based upon the V&H coordinates of the calling party and the

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[2] See http://www.trainfo.com/, visited April 19, 1999.

[3] Data are available either downloaded via tape or CD-ROM, or in a text report.

[4] Other elements of call rating may be time of day, length of call, or type of service. Trends have shown that distance sensitive rating becomes less prevalent as competition increases. Long distance telephone

V&H coordinates of the called party, which together identify whether a call is "toll" or "local." Typically, the respective definitions of toll and local are made in the state (intrastate toll – e.g., some state commissions have decided that calls between rate center pairs of distance greater than X miles will be subject to intraLATA toll) or federal (interstate toll) regulatory jurisdictions. Those definitions are applied in the network when the switches, in effect, use the NPA-NXX of the calling party and the NPA-NXX of the called party to route the call and record call information. Interexchange carriers (IXCs) may provide the transport of a toll call, if regulatory conditions permit competition.[5]

Customers that purchase certain "special" services, such as extended local calling privileges, are associated with specific NPA-NXXs. Despite the fact that these NPA-NXXs still have V&H coordinates that reflect the rate areas in which these special end-users are located, calls to and/or from these NPA-NXXs may require call rating that is not based on distance. These services rely on comparisons of the calling and called parties' NPA-NXXs without regard to the V&H coordinates associated with them.

Ultimately, the potential scope of local calling is limited by toll boundaries. When calls cross toll boundaries, access charges must be paid to the terminating carrier. The excessive level of these charges effectively limits the ability of new entrants to offer innovative calling plans to end-users.

3.0 Consistent Rate Area Carriers

To date, most carriers that offer local exchange services have adhered to consistent rate areas by matching their rate areas to those of the incumbent. This strategy has enabled new entrants to launch service relatively quickly by avoiding the potentially lengthy

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service is an example of this where distance was a factor early on, but today most of the calling plans being offered by IXCs are postalized rates, regardless of whether the call is to a neighboring state or across the country.

[5] IntraLATA dialing parity allows competition on a broad scale and is available is most states. Remaining states will implement intraLATA dialing parity, as per the Commission's mandated schedule. IntraLATA toll calls may be carried by either an interexchange carrier or by the LEC. The route depends on the choice

negotiations and regulatory approval process that inconsistent rate areas would entail. To adhere to consistent rate areas, these new entrants must obtain a block of numbers for each rate area in which they intend to offer service. There are a number of reasons to operate in this manner (regulatory, contractual, technical, etc.), but the choice of consistent rate areas need not restrict carriers from offering various calling plans to their customers. Despite adhering to consistent rate areas, CLECs may offer calling plans that differ from those offered by the incumbent. For example, an ILEC may offer a calling plan which allows "free" calling to some neighboring rate areas while calls to other non-neighboring rate areas would not be included in the base rate (i.e., calls to more distant areas might be charged based on message units). Meanwhile, a CLEC may offer unlimited local calling throughout the area, so long as toll boundaries are not crossed.

A significant benefit of consistent rate areas, is that their use permits a clear demarcation of traffic subject to local interconnection rates (e.g., reciprocal compensation) from traffic subject to access charges. Interconnection agreements established pursuant to sections 251 and 252 of the Telecommunications Act of 1996, govern inter-carrier payments and compensation for the mutual exchange of local exchange traffic. However, intrastate or interstate access tariffs govern payments to carriers when a "long-distance" or "toll" call is originated or terminated. State regulatory commission orders and, ultimately, the incumbent's tariffs define the difference between local and toll calls.

By adhering to consistent rate areas, a CLEC can ensure that all calls made by or to its end users, both within and between rate areas, fall into the same inter-carrier compensation category, (i.e., reciprocal compensation versus access) as identical calls made by or to end users served by the ILEC. As a practical matter, the terminating carrier determines the compensation category of any call. Thus, a CLEC that adheres to consistent rate areas will utilize its interconnection agreements and access tariff in exactly the same manner that the ILEC does.

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of the customer, who either presubscribes or "dials around" using a "10-10" dialing pattern. InterLATA toll calls are routed to an interexchange carrier.

3.1 Rate Center Consolidation

It is clear that rate center consolidation can provide code conservation benefits, particularly if implemented early in the life of an NPA, and/or prior to widespread CLEC entry. When a carrier has fewer switches serving a large calling area, rate center consolidation can allow a single NXX to serve this larger area. This may help to limit the amount of spare "stranded" numbers in a region that would otherwise consist of many rate areas in a small geography. Since a carrier must obtain a block of numbers for each rate area (either an NXX or a thousand block if pooling is implemented), rate center consolidation can reduce the amount of unused numbers in a carrier's inventory by allowing the carrier to serve more customers out of a single NPA-NXX. See Figure 1 for a pictorial description.

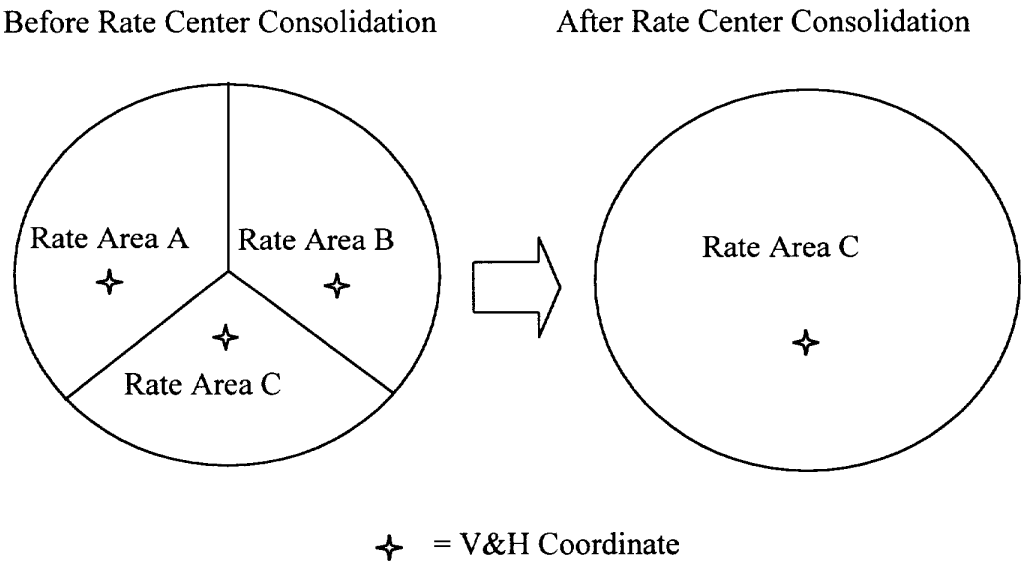

Figure 1 – Rate Center Consolidation

In this example, three rate areas (Rate Areas A, B, and C) are consolidated into a single rate area (Rate Area C). It is important to note that rate center consolidation does not require the introduction of new V&H coordinates. A consolidated rate area will use the V&H coordinates of one of the old rate areas that were combined to create the new rate area. In Figure 1, Rate Area C's V&H coordinates are used for the new consolidated rate area.

Rate center consolidation should always be considered where rate areas have lost their rating significance relative to each other. This can happen, for example, where adjacent rate areas that once represented two separate communities, now divide a single community. Since calls to or from these nominally separate rate areas receive identical rating treatment, there is no longer a need for two rate areas, and they are superfluous. Such a rate center consolidation can be implemented quickly with no impact to customers or to carrier revenues.[6] However, this situation is relatively rare.

[6] Empirical evidence in Texas has shown that a simple rate center consolidation that does not impact call rating can be completed in a four-month timeframe.

More analysis is required where rate areas maintain their rating significance relative to each other. Rate center consolidation in this environment is complicated by changes to both local and toll boundaries that may affect customer charges and carrier revenues. Prior to any rate center consolidation, toll calling may be required among several of the rate areas. After consolidation, all calling within the boundaries of the consolidated rate area will become local. Calls that cross the boundaries of the consolidated rate area, that previously were local, may be toll and vice versa. These impacts can cause a shift between local and toll revenues, possibly among several carriers, since an end user may use different carriers for local and toll services. In order to make up for lost revenues rate adjustments may be required.[7] Since the interexchange market is highly competitive, IXCs may be unable to recoup lost toll revenues.

In some cases of rate center consolidation, revenue neutrality can be maintained for the ILEC by shifting specific wire centers[8] from one rate area to another. However, unless rate center consolidation encompasses entire rate areas, CLECs and their customers will suffer an undue burden from the consolidation. Rate center consolidations that take specific wire centers from one rate area and move them to a different rate area in an attempt to balance ILEC rating structures, are likely to require that some CLEC customers take a 10-digit number change.

Since emergency service bureaus do not always coincide with rate area boundaries, any rate center consolidation must consider potential impacts to 911 emergency service operations. In an area where multiple emergency service bureaus serve different parts of an area, there must be a way to segregate which traffic should go to which emergency service bureau. Carriers often use the customer's NPA-NXX to determine the appropriate emergency service bureau. When rate center consolidation encompasses

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[7] Since ILEC local rates are regulated, any rate adjustment due to a rate area consolidation may involve protracted negotiations between the ILEC and regulators.

[8] A wire center is the location where the telephone company terminates subscriber outside cable plant (i.e., their local loops) with the necessary testing facilities to maintain them. (See, *Newton's Telecom Dictionary* by Harry Newton, 11th Edition (1996), p. 671.

multiple emergency service bureau regions, routing mechanisms other than the NPA-NXX must be used in order to gain maximum code conservation efficiencies.[9]

Rate area consolidations can limit future options for area code relief. When rate areas are consolidated, CLECs will distribute numbers from all NPA-NXXs assigned to them for that consolidated rate area, to customers located throughout the rate area. This makes it imperative that area code boundaries not partition the consolidated rate area. A geographic split that divides a rate area is likely to result in CLEC customers that use the same NXX, being located on both sides of the new area code boundaries. When this happens, the CLEC must either be assigned that particular NXX in each of the NPAs, or CLEC customers on one side of the boundary will have to undergo 10-digit number changes (i.e., those customers will require a new NPA and a new NXX-XXXX). If the CLEC is assigned duplicate NXXs, then more NXXs will be assigned than would otherwise be required. If CLEC customers are forced to undergo 10-digit number changes while other carrier-types do not, then the CLEC customers will suffer an undue and discriminatory burden. Thus, consolidation can effectively eliminate geographic splits as an efficient and equitable form of relief from the state's options.

[9] Technical solutions to the emergency service bureau routing issue are available through Line Class Code routing or Advanced Intelligent Networks, but are time consuming to implement.

4.0 Inconsistent Rate Centers

4.1 Description

Inconsistent Rate Centers (IRC) can be thought of as rate centers consolidations in which not every LEC participates. One or more LECs may elect, with any necessary approval, to combine some existing rate areas into a single rate area. These new rate areas are only combinations of existing rate area boundaries. The inconsistency arises because one or more LECs do not treat the combined rate areas as a new single rate area. Refer to Figure 2 for a more detailed explanation of IRCs.

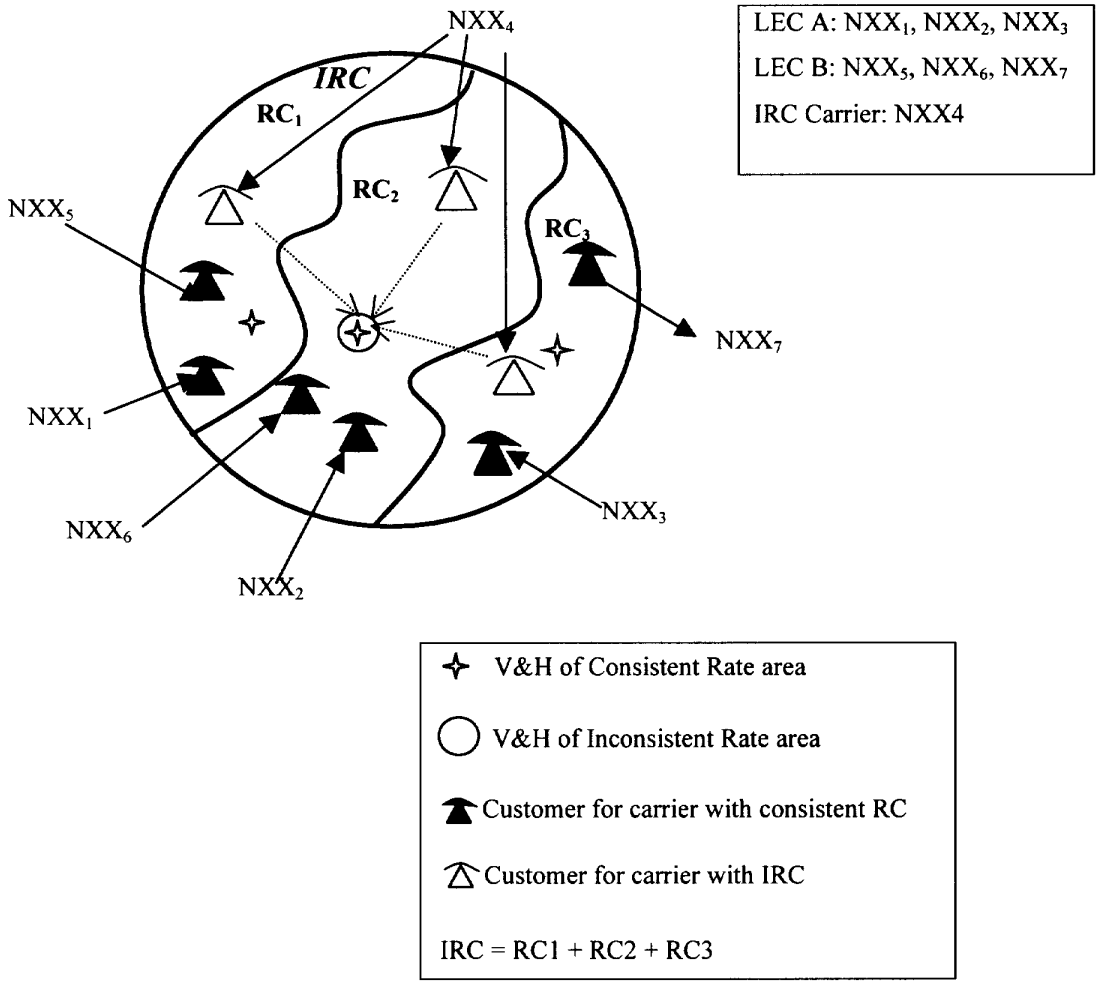

Figure 2 – Inconsistent Rate Center

In the example above, the IRC is made up of three consistent rate areas: RC1, RC_2 and RC_3. In this example, the V&H coordinates of the IRC are shared with the V&H coordinates of RC_2. Since the IRC covers the entire area of RC_1, RC_2 and RC_3, a single NXX (NXX_4) can support customers in each of those physical areas. Meanwhile, the consistent rate area carrier(s) must obtain an NXX for each rate area. In the example above, two separate carriers use consistent rate areas. LEC A is assigned NXX_1, NXX_2, and NXX_3, which are respectively associated with RC_1, RC_2 and RC_3. LEC A **does not** have a special IRC interconnect agreement with the IRC carrier. LEC B is assigned NXX_5, NXX_6 and NXX_7, which are similarly associated with RC_1, RC_2 and RC_3. LEC B **does** have a special interconnect agreement with the IRC carrier, for the purposes of this example. In addition, assume that LEC A and LEC B agree to a local compensation rate for calls terminated on the other carrier's network within the same rate area and that LEC B is an ILEC. For all calls destined to cross rate center boundaries, the carriers agree to pay the other carrier's tariffed access charges.

On the other hand, the IRC carrier and LEC B have negotiated an inter-company agreement that charges the other carrier a rate in-between the local compensation rate and access charges for terminating calls to the other carrier's network.[10] Therefore in Table 1, all calls between LEC B and the IRC carrier can now be rated as local calls to and from NXX_4 and NXX_5, NXX_6, NXX_7 because the compensation rate between the carriers do not force the carriers to collect toll revenue to cover the cost of the carrier compensation. (See the highlighted yellow (lighter gray) in Table 1).

Since no such inter-company agreement exists between the IRC carrier and LEC A, the compensation between these two carriers will be either local compensation or access depending on the origination and termination of the calls as described below:

For calls from the IRC carrier to LEC A: Since these carriers do not have an inter-carrier agreement, it is safe to assume that they do not have direct connections to each other's network for local interconnection, hence, all traffic between the two carriers is routed

through the ILEC (LEC B). So the IRC carrier will hand off calls to NXX_1, NXX_2 and NXX_3 to the ILEC, who, in turn will route the calls as already defined in its network (i.e., as toll calls for inter-rate center calls and local for calls in RC_2). Therefore, the IRC carrier will be charged access for calls to LEC A's NXX_1 and NXX_3, whereas, calls (from the IRC carrier) to similar situated customers of LEC B, the IRC carrier will be charged the negotiated compensation rate described above. The IRC carrier has two choices: 1) it can charge its customers toll charges to cover the access rates it will pay to the LEC A; or, 2) it does not fully recover the cost of calls to LEC A.[11]

For calls from LEC A to the IRC Carrier: Again calls from LEC A destined for the IRC carrier will traverse through the ILEC (LEC B). So LEC A will send the IRC carrier's calls based on the routing already in place in LEC B's network. That is, calls in RC_2 will be routed over local interconnection trunks and inter-rate center calls will be routed over access trunks. Since the inter-rate center calls will be treated as toll calls, these calls will terminate to a LEC A customer's pre-subscribed toll carrier, who in turn will be charged access and will terminate the call to the IRC carrier. The customer will be charged toll rates from its pre-subscribed carrier for these calls. Whereas, similarly situated customers of LEC B will be charged local rates for these calls because of its re-arranged agreement with the IRC carrier. (See highlighted green (darker gray) in Table 1).

From\To		**NXX_1**	**NXX_2**	**NXX_3**	**NXX_4**	**NXX_5**	**NXX_6**	**NXX_7**
	LEC	**A**	**A**	**A**	**IRC**	**B**	**B**	**B**
NXX_1	**A**	Local	Toll	Toll	[redacted]	Local	Toll	Toll
NXX_2	**A**	Toll	Local	Toll	[redacted]	Toll	Local	Toll
NXX_3	**A**	Toll	Toll	Local	[redacted]	Toll	Toll	Local
NXX_4	**IRC**	[redacted]	[redacted]	[redacted]	**Local**	**Local**	**Local**	**Local**
NXX_5	**B**	Local	Toll	Toll	**Local**	Local	Toll	Toll
NXX_6	**B**	Toll	Local	Toll	**Local**	Toll	Local	Toll
NXX_7	**B**	Toll	Toll	Local	**Local**	Toll	Toll	Local

Table 1 – Call Designation Between NXXs

[10] Such calls may not be local or toll but might technically fall into a third category.
[11] The optimal solution would be to obtain an inter-company agreement with all LECs; however, such activity is not practical and may take years to accomplish.

Customers of an IRC carrier are able to move anywhere within the bounds of the IRC and still retain their original telephone number. Customers of a consistent rate area carrier, can move and retain their telephone number only within their consistent rate area (i.e., customers of a consistent rate area carrier who are located in RC1, can move only within RC1 and retain their number, while customers of the IRC can move and retain their number throughout RC1, RC2 and RC3). It is conceivable that calls between neighboring customers who reside within the boundaries of a consistent rate area, one belonging to the IRC carrier, the other belonging to the consistent rate area carrier, could be toll calls depending on the intercompany agreement that is established.

A general deployment of IRCs would have other impacts as well. The following sections discuss some general implications of IRCs, specifically those related to Local Number Portability (LNP) and LNP-based conservation mechanisms.

4.2 General Implications of IRCs

Since IRCs make it substantially more difficult to trace and audit the demarcation of toll and local, it is likely that toll access and local interconnect rates with IRC carriers would require renegotiation based upon specific circumstances. While it is conceivable that all carriers within a region may be able to establish interconnect agreements that treat IRC carriers and their NXXs separately from other NXXs, experience has shown that establishing an interconnect arrangement based on consistent rate areas can be a difficult and time-consuming process. Raising the level of difficulty exponentially by adding in the establishment of inconsistent rate centers is not a task that should be underestimated.

As discussed previously, the LERG serves as the sole means for communicating rating and routing information among all carriers. In order for IRCs to work effectively among many carriers, a communication mechanism that identifies alternative rating mechanisms for IRCs is needed. This could take the form of changes to the LERG that identify specific NXXs as IRCs. Carriers would then use this designation in their billing systems